COB Colebatch Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Gently undulating plains and low rises in the southern part of Hundred of Colebatch

Area: 110.0 km^2

Annual rainfall: 500 – 525 mm average

Geology: The Land System is formed on sandy sediments of the Padthaway Formation, interspersed with calcarenites of the Bridgewater Formation. The latter are remnants of ancient coastal dunes. Bridgewater, (and commonly Padthaway) Formation sediments are calcrete capped. Scattered over the main landscape are deposits of Molineaux Sand.

Topography: The Colebatch Land System comprises mainly very gently to gently undulating plains and low rises up to 15 m high. In the south is a more extensive calcarenite rise up to 25 m high with slopes of up to 8%. This is an outlier of the stonier and more hilly Taunta Land System. Most of the lower rises are sandy, although the calcrete cap of the calcarenite occurs at depth. Low to moderate jumbled sand dunes with a general east - west orientation overlie both rises and flats. There are occasional small swampy depressions on the flats, and also in some swales between the sand dunes. It is likely that in these areas the regional groundwater table is near the surface. The swamps are moderately saline.

Elevation: 10 - 40 m

Relief: Up to 25 m, but usually less than 15 m

Soils: Sandy soils predominate. Some are more than a metre deep, others have a more clayey subsoil at moderate depth. Shallow sandy to sandy loam soils with variable subsoils overlying calcreted materials are limited.

Main soils

Soils formed on Padthaway Formation sediments

B6/B3 Shallow stony sandy loam over calcrete
B7a Loamy sand over sandy clay loam on calcrete
H3/G2 Thick sand over yellow brown sandy clay

Soils formed on Molineaux Sand

H3 Deep bleached sand

Soils formed on Bridgewater Formation calcarenites

B3 Shallow stony loamy sand over calcrete
B7b Loamy sand over sandy clay loam on calcrete
G2 Sand over yellow brown sandy clay

Main features: The Colebatch Land System is virtually all potentially arable, but low fertility and areas of shallow stony soils restrict land use to mainly pastures. Potential for wind erosion, and moderate to high water repellence further limit cropping opportunities. Although only minor areas are currently affected by salinization, the flats are at risk if saline water tables continue to rise.

Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Colebatch Land System:

SLU	% of area	Main features #
MHB	8.0	Low rises formed on calcreted calcarenite and overlain by siliceous sand. Relief is up to 25 m, but is usually less than 15 m. There is variable surface calcrete, depending on thickness of aeolian sand, but stone cover is usually less than 20%. There are occasional reefs of sheet rock. Sand is sometimes in dune form. Main soils: deep bleached sand - **H3** (C) and sand over yellow brown sandy clay - **G2** (C) on sandy slopes (about half the area), with shallow stony loamy sand over calcrete - **B3** (C) and loamy sand over sandy clay loam on calcrete - **B7b** (L) on stony land. Key properties: Drainage: Rapidly to well drained. Fertility: Very low on deep sands to moderately low on stony soils. Physical condition: Surface soils are soft to loose and do not restrict root growth. Where subsoils occur they are friable and not restrictive to root growth. AWHC: Moderate on sandy soils. Very low to low on stony soils, due to shallow depth to hard calcrete. Salinity: Low. Erosion potential: Water: Low to moderate, depending on slope. Wind: High on sand spreads to moderately low on stony ground. Water repellence: Strong on sand spreads. Low to slight on stony land. Rockiness: Nil on sand spreads. Variable to 50%, usually less than 20%. Other: The higher rises are exposed. Summary: Deep, low fertility, water repellent and erodible sands with shallow, stony soils of marginal fertility.
NAA	21.5	Very gently undulating plain formed on sandy sediments of the Padthaway Formation. Low sandy and stony rises have relief of only a few metres. Main soils: loamy sand over sandy clay loam on calcrete - **B7a** (E), thick sand over yellow brown sandy clay - **H3/G2** (E) and shallow stony sandy loam over calcrete - **B6/B3** (C), with shallower soils over calcrete as for **MHB** on stony rises. Key properties: Drainage: Well drained. Fertility: Low. Physical condition: No physical constraints to root growth. AWHC: Moderately low. Salinity: Moderately low to low. Erosion potential: Water: Low. Wind: Moderate Water repelllence: Moderate to high. Rockiness Nil to minor. Summary: Well drained and non saline, but low fertility, water repellence and wind erosion potential limit productivity.
NGD NGd	51.4 1.2	**NGD** Gently undulating land comprising a complex of flats, sandy rises, some stony rises and minor depressions. Underlying materials are sandy sediments of the Padthaway Formation. Recent Molineaux Sands partially overlie the landscape. **NGd** As for **NGD** but with 10-20% swampy depressions. Main soils: thick sand over yellow brown sandy clay - **H3/G2** (E), loamy sand over sandy clay loam on calcrete - **B7a** (L) and shallow stony sandy loam over calcrete - **B6/B3** (L) on flats, deep bleached sand - **H3** (L) on deeper sand rises, with shallower loamy sand over sandy clay loam on calcrete - **B7b** (L) and shallow stony loamy sand over calcrete - **B3** (L) on stony rises. Key properties: Drainage: Well drained generally to imperfectly drained in swampy depressions. Fertility: Low. Physical condition: No physical limitations to root growth. AWHC: Low to moderately low. Salinity: Moderately low to low. High in swampy depressions. Erosion potential: Water: Low Wind: Moderately low to high. Water repellence: Moderate to high. Rockiness: Less than 2% surface calcrete stone.

		Summary: Generally deep, well drained and non saline soils, but low fertility, water repellence and wind erosion potential limit productivity.
OAF	17.9	Low to moderate jumbled sand dunes with more than 60% dunes alternating with irregular shaped closed depressions which are occasionally swampy. Main soils: deep bleached sand - **H3** (V) on dunes, with thick sand over yellow brown sandy clay - **H3/G2** (L), loamy sand over sandy clay loam on calcrete - **B7a** (L) and shallow stony sandy loam over calcrete - **B6/B3** (L) in swales. Key properties: Drainage: Rapidly to well drained. Fertility: Low to very low. Physical condition: There are no impediments to root growth. AWHC: Moderately low to moderate. Salinity: Low. Erosion potential: Water: Low. Wind: Moderate to high. Water repellence: High. Rockiness: Nil. Summary: Sandy rises with very low fertility, well drained soils prone to water repellence and erosion.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D) Dominant in extent (>90% of SLU)
(V) Very extensive in extent (60–90% of SLU)
(E) Extensive in extent (30–60% of SLU)
(C) Common in extent (20–30% of SLU)
(L) Limited in extent (10–20% of SLU)
(M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

Soils formed on Padthaway Formation sediments

B6/B3 Shallow stony sandy loam over calcrete (Petrocalcic / Lithocalcic, Brown Chromosol / Kandosol)
Thin sandy loam over a brown to red sandy clay with variable rubble overlying calcreted interbedded limestone and clay shallower than 50 cm.

B7a Loamy sand over sandy clay loam on calcrete (Petrocalcic, Brown Chromosol)
Medium to thick brown loamy sand abruptly overlying a brown weakly structured friable sandy clay loam to sandy clay over calcreted interbedded limestone and clay within 100 cm.

H3/G2 Thick sand over yellow brown sandy clay (Bleached, Petrocalcic Brown Chromosol)
Thick to very thick sand with a bleached A2 layer abruptly overlying a yellow brown sandy clay loam to sandy clay over calcreted interbedded limestone and clay within 100 cm.

Soils formed on Bridgewater Formation calcarenites

B3 Shallow stony loamy sand over calcrete (Petrocalcic, Leptic Tenosol)
Loamy sand to sandy loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm.

B7b Loamy sand over sandy clay loam on calcrete (Petrocalcic, Brown / Red Chromosol / Kandosol)
Medium thickness brown loamy sand abruptly overlying a thin brown to red weakly structured friable sandy clay loam over calcreted calcarenite.

G2 Sand over yellow brown sandy clay (Bleached, Petrocalcic, Brown Chromosol)
Thick sand with a bleached A2 layer abruptly overlying a yellow brown sandy clay loam to sandy clay over calcreted calcarenite at depths of between 100 and 150 cm.

Soils formed on Molineaux Sand

H3 Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.

Further information: DEWNR Soil and Land Program